



UNITED STATES PATENT AND TRADEMARK OFFICE

6c
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/681,406

03/30/2001

Christopher Judson Hardy

RD-28383

3214

6147

7590

12/03/2003

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH CENTER
PATENT DOCKET RM. 4A59
PO BOX 8, BLDG. K-1 ROSS
NISKAYUNA, NY 12309

EXAMINER

ROBINSON, DANIEL LEON

ART UNIT

PAPER NUMBER

3742

DATE MAILED: 12/03/2003 5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/681,406

Applicant(s)

HARDY ET AL.

Examiner

Daniel I. Robinson

Art Unit

3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on papers filed 8-27-2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 13-25 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6 and 9 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 8 and 10-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Election/Restrictions

Applicant's election with traverse of Species A, Claims 1-12 in Paper No. 4 is acknowledged. The traversal is on the ground(s) that the Species A-D are not independent or distinct. This is not found persuasive because the inventions are independent and mutually exclusive since one method involves a patient holding his breath and another has the patient free-breathing.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 7, 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadono(U.S.Pat.6,088,485) in view of Itagaki et al.(U.S.Pat.5,928,146). Kadono discloses a method and apparatus and program recording media for image coding and image decoding that shows many of the features of the claimed reference including acquiring a reference data set of a region of interest(a coronary vessel), acquiring a plurality of data sets and processing the acquired data sets as compared to the reference data set, via cross correlation and reconstruction in two dimensions. Kadono fails to disclose explicitly that the system is used for an mri scan or that a multi slice data set is achieved. Itagaki discloses an inspection apparatus using nuclear

Art Unit: 3742

magnetic resonance that explicitly shows using a reference data set comprised of a breath held data set of an mri system used for multi slice imaging. It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to use the system of Kadono with the modifications taught by Itagaki because the mri system is non invasive and the breath held reference data set reduces the influence of body motion.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Kadono reference as applied to claims 1-3, 7, 8, and 12 above, and further in view of Nevo(U.S.Pat.6,594,517). The modified Kadono reference does not a reference data set of a free breathing data set. Nevo discloses a method and apparatus for generating controlled toques on objects inside a living body that shows a free breathing data set. It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to use a free breathing reference data set as taught by Nevo with the modified Kadono reference because a dynamic reference image can be created.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Kadono reference as applied to claims 1-3, 7, 8, 12 above, and further in view of Foo (U.S.6,611,701). The modified Kadono reference does not show a region of interest as a coronary artery. Foo discloses a method and apparatus for fast breath held 3D data acquisition using variable sampling that shows a region of interest as a coronary vessel. It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to have a region of interest being a coronary vessel to provide a coronary artery angiography.

Art Unit: 3742

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the modified Kadono reference as applied to claims 1-3, 7, 8, and 12 above, and further in view of Cline et al. (U.S. Pat. 6,281,681). The modified Kadono reference does not show spiral trajectory sampling where the density of samples is greater in the center of k-space. Cline discloses a magnetic resonance imaging with interleaved fibonacci spiral scanning that shows spiral sampling with sampling greater in the center (figs. 1-3). It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to use spiral trajectory sampling as taught by Cline because a single pulse sequence may be used to sample all of k-space.

Claims 6 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Macovski and Riederer are cited to show structure and methods similar to the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel I. Robinson whose telephone number is 703 306-9043. The examiner can normally be reached on M-F 5:30am-2:30pm.

The fax phone number for the organization where this application or proceeding is assigned is 872-9302.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0861.

dlr

DANIEL ROBINSON
PATENT EXAMINER
